

METHODS AND APPARATUSES FOR LAUNCHING UNMANNED AIRCRAFT,  
INCLUDING METHODS AND APPARATUSES FOR TRANSMITTING FORCES  
TO THE AIRCRAFT DURING LAUNCH

ABSTRACT OF THE DISCLOSURE

Methods and apparatuses for launching unmanned aircraft and other flight devices or projectiles are described. In one embodiment, the aircraft can be launched from an apparatus that includes an extendable boom. A launch carriage is positioned on a launch guide structure of the boom and carries the aircraft during takeoff. An energy reservoir is configured to provide energy to the launch carriage during takeoff of the aircraft, and can absorb energy from the launch carriage to decelerate the launch carriage after takeoff. The apparatus can further include a transmission that smoothly and rapidly accelerates and/or decelerates the launch carriage.